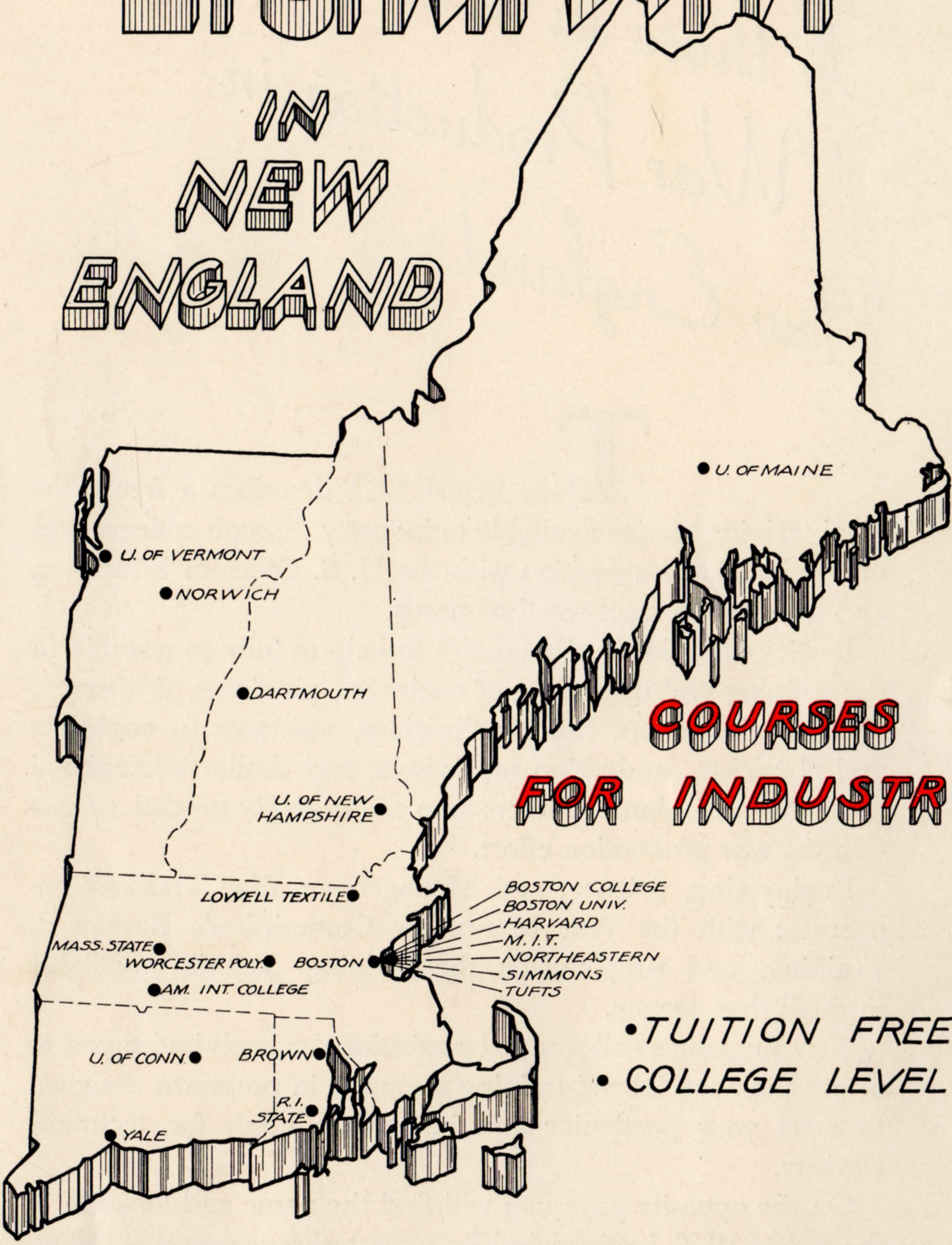
E. S. M. W. T.

IN NEW ENGLAND



COURSES FOR INDUSTRY

- TUITION FREE
- COLLEGE LEVEL

ENGINEERING SCIENCE AND MANAGEMENT WAR TRAINING

SPONSORED BY THE UNITED STATES OFFICE OF EDUCATION

To those in Charge of War Production in New England

THIS BOOKLET describes a free technical training service available to industry through colleges and universities in co-operation with the U. S. Office of Education and designed to meet wartime needs.

Participating institutions desire to help as fully as possible in the training and upgrading of engineers, physicists, draftsmen, chemists, inspectors, radio technicians, assistants to engineers and physicists, production supervisors, and similar professional and semi-professional workers who are urgently needed to sustain the war production effort.

Engineering, Science, and Management War Training cooperates with the War Manpower Commission's Bureau of Training, and supplements the training facilities available through that agency.

New England's colleges and professional schools invite you to utilize their specialized training resources in programs designed to meet your particular and immediate needs for technical workers.

On the opposite page you will find the name and location of the E.S.M.W.T. Institutional Representative nearest your plant. Telephone or write to him for further information.

Engineering, Science, and Management War Training

REGION 1

WILLIAM C. WHITE, *Regional Adviser*
Dean of Engineering, Northeastern University, Boston — Kenmore 5800

PROFESSOR GEORGE H. MESERVE, JR.,
Field Representative, Boston — Kenmore 5800

MASSACHUSETTS —

AMERICAN INTERNATIONAL COLLEGE, SPRINGFIELD
MR. RICHARD S. ULLERY. *Phone:* Springfield 6-4616

BOSTON COLLEGE, CHESTNUT HILL
DR. FREDERICK J. GUERIN. *Phone:* Boston — Bigelow 1480

BOSTON UNIVERSITY, BOSTON
DEAN WILLIAM G. SUTCLIFFE. *Phone:* Boston — Kenmore 8810

HARVARD UNIVERSITY, CAMBRIDGE
PROFESSOR CHESTER L. DAWES. *Phone:* Boston — Kirkland 7600

LOWELL TEXTILE INSTITUTE, LOWELL
PROFESSOR A. EDWIN WELLS. *Phone:* Lowell 6394

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
PROFESSOR RAYMOND D. DOUGLASS. *Phone:* Boston — Kirkland 6900

MASSACHUSETTS STATE COLLEGE, AMHERST
PROFESSOR C. I. GUNNESS. *Phone:* Amherst 900

NORTHEASTERN UNIVERSITY, BOSTON
PROFESSOR ALBERT E. EVERETT. *Phone:* Boston — Kenmore 5800

SIMMONS COLLEGE, BOSTON
DR. JOHN A. TIMM. *Phone:* Boston — Longwood 7400

TUFTS COLLEGE, MEDFORD HILLSIDE
DEAN HARRY P. BURDEN. *Phone:* Somerville — Prospect 2100

WORCESTER POLYTECHNIC INSTITUTE, WORCESTER
DEAN FRANCIS W. ROYS. *Phone:* Worcester 3-1411

MAINE —

UNIVERSITY OF MAINE, ORONO
MR. HORACE A. PRATT. *Phone:* Orono 441

NEW HAMPSHIRE —

UNIVERSITY OF NEW HAMPSHIRE, DURHAM
DEAN LEON W. HITCHCOCK. *Phone:* Durham 156

DARTMOUTH COLLEGE, HANOVER
DEAN FRANK W. GARRAN. *Phone:* Hanover 30

VERMONT —

NORWICH UNIVERSITY, NORTHFIELD
MAJOR N. RICHARD BUTLER. *Phone:* Northfield 31-3

UNIVERSITY OF VERMONT, BURLINGTON
PROFESSOR ROBERT G. CHAPMAN. *Phone:* Burlington 5000

REGION 2

LAUREN E. SEELEY, *Regional Adviser*
Associate Professor of Mechanical Engineering, Yale University, New Haven, Connecticut
New Haven 7-3131

CONNECTICUT —

UNIVERSITY OF CONNECTICUT, STORRS
PROFESSOR EVERETT A. TEAL. *Phone:* Willimantic 9321

YALE UNIVERSITY, NEW HAVEN
PROFESSOR FOREST R. HUGHES. *Phone:* New Haven 7-3131

RHODE ISLAND —

BROWN UNIVERSITY, PROVIDENCE
PROFESSOR FREDERICK N. TOMPKINS. *Phone:* Providence—Gaspee 6771

RHODE ISLAND STATE COLLEGE,
Providence Office, 25 Park Street
DEAN ASA S. KNOWLES. *Phone:* Providence — Gaspee 7587

The participating colleges and universities listed above are the sources of E.S.M.W.T. in New England. At each college the designated Institutional Representative is directly responsible for the organization and administration of all courses sponsored by his institution.

Regional Advisers, also listed above, serve as chairmen of committees comprising the Institutional Representatives in their areas and will be glad to answer any general questions about the E.S.M.W.T. program.

Some classes are conducted in University classrooms and laboratories.

What Is E.S.M.W.T.?

Engineering, Science, and Management War Training is a program set up specifically to serve war industries. It is organized under the United States Office of Education and financed by the federal government for the purpose of enabling colleges and universities to provide short courses of types approved by the chairman of the War Manpower Commission and designed to meet the shortage of engineers, chemists, physicists, and production supervisors in fields essential to the national defense. It is not a general college program, but training for specific activities.

What Can E.S.M.W.T. Do for War Industry?

Institutions participating in E.S.M.W.T. can set up tuition free, special training courses of college grade to prepare employees in war industries for more effective service. These courses may be offered on the college campus, or at an industrial plant, or in public school buildings in a community where several war industries are located. The courses may be designed to prepare new workers who need preproduction training or to upgrade employees already in the plant who need additional knowledge and skill in order to replace technical personnel who have been released to the armed forces.

The course may be taught by a member of the university faculty or by a qualified man from industry. The college sponsoring the course is responsible for determining the subject matter, selecting a well qualified instructor, and for educational administration and supervision including relationships with the United States Office of Education.

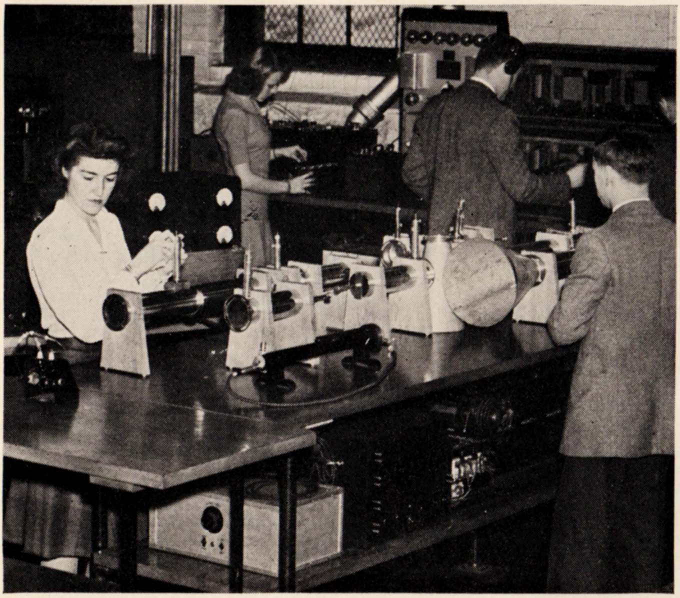
What Is the Nature and Scope of the Training?

E.S.M.W.T. courses are not standardized. Each course is separately planned to meet a specific need. This need must be at the college level and must fall within one of the fields in which courses are authorized; namely, engineering, physics, chemistry, or production supervision. In general, the courses are from twelve to sixteen weeks in length. Part-time courses range from fifty to one hundred eighty hours in class and preparation; full-time courses from four hundred to eight hundred hours. Within reasonable limits, the program is flexible and can be adapted to varied war training needs.

What Are the Requirements for E. S. M. W. T. Courses?

High school graduation or the equivalent and employment or expected employment in war industry are basic requirements for admission to all courses. The admission requirements for each course, however, are established by the sponsoring institution on the basis of the subject matter content and the specific purpose of the training. Some courses require several years of college work or of industrial experience.

There is no charge for tuition, but trainees are expected to provide their own textbooks and incidental materials. Both men and women can be trained under E.S.M.W.T. and there is no discrimination among candidates because of race or color.



Other classes are held at industrial plants.

Typical Intensive Courses Offered by E. S. M. W. T.

Accounting, Production, Management

Budgetary Control for Executives and Engineers
Elements of Production Engineering
Freight Traffic Management
Industrial Accounting
Job Analysis and Evaluation
Industrial Safety
Industrial Supervision
Labor Relations
Methods Engineering
Production Control
Statistical Methods in Inspection
Time and Motion Study
Transportation and Traffic Control
Wage Administration

Chemistry and Chemical Engineering

Chemical Engineering for Plant Supervisors
Chemistry of Textile Fabrics
Glass-blowing Techniques
Industrial Plastics
Metallurgical Chemistry
Non-Ferrous Metallurgy
Organic Chemistry
Principles of Metallurgy
Quantitative Chemical Analysis
Rubber Technology

Drawing, Design, and Mechanical Engineering

Aircraft Engine Design
Applied Photoelasticity
Descriptive Geometry
Engineering Drawing
Hydrographic Drafting
Intensified Sheet Metal Drafting
Jig and Fixture Design
Machine Design
Metallography
Precision Parts Inspection
Principles of Power Plant Operation
Screw, Machine, Tool and Cam Design
Steam Engineering
Strength of Materials

Electrical Engineering and Radio

Alternating Currents
Cathode Ray Oscilloscopes
Direct Current Circuits and Machinery
Electrical Inspection and Testing
Fundamentals of Radio
Industrial Applications of Electron Theory
Industrial Electricity
Industrial Electronics Control Systems
Ultra High Frequency Technics
Vacuum Tubes and Radio Circuits

Mathematics and Physics

Analytical Geometry and Introduction to Calculus
Differential Calculus
Differential Equations
Integral Calculus
Mathematical Physics for Women Technicians
Mathematics for Navy Yard Designers
Mathematics for Teachers
Mathematics of Radio Communications
Pre-engineering Mathematics
Optical Instruments
Physics for Teachers

This partial list of courses that have already been offered is representative and will serve to indicate the type of training available.

Specialized College Level Training for Industry

For purposes of illustration, three detailed outlines of typical part-time E.S.M.W.T. courses are presented here. These will serve to show the way in which the program operates to fill specific war training needs.

1. METHODS ENGINEERING

PURPOSE OF COURSE. To provide training for those now engaged in war production to enable them to increase production.

QUALIFICATIONS FOR ADMISSION. Two years of an engineering school course of study or the equivalent in training and experience. High school graduates with extensive experience in shop practice and production may be qualified for admission. Employer endorsement required.

LENGTH OF COURSE. *Sixteen weeks* — one three-hour class per week. Total, including preparation, 80 hours.

COURSE CONTENT. Process and operation analysis through the use of process charts, flow diagrams, operation charts, man-and-machine charts, micromotion study, principles of motion economy. Work place layout, labor-saving tools and equipment, laboratory development work. Elementary time study. Setting up synthetic standards using elemental time values. Wage incentives, problems involved in the introduction of work simplification with particular emphasis upon employee morale.

2. CATHODE RAY OSCILLOSCOPES

PURPOSE OF COURSE. To provide radio technicians with a comprehensive knowledge of the cathode ray oscilloscope and its applications.

QUALIFICATIONS FOR ADMISSION. High school graduation, including courses in mathematics and physics plus additional training or experience in radio. Employer endorsement required.

LENGTH OF COURSE. *Twelve weeks* — two three-hour classes per week, lecture and laboratory. Total, including preparation, 150 hours.

COURSE CONTENT. Oscillographs, origin of cathode ray tube and development, elementary electron optics, electrostatic and magnetic deflection, the fluorescent screen, sweep circuit oscillators. Uses of the cathode ray oscillograph, including measurement of voltage and current, frequency measurement, time intervals, wave form analysis, checking distortion, modulation percentage. Electronic switches. Cathode ray power supplies. Complete oscillograph circuits analyzed. Wobbulators for making frequency curves.

3. STATISTICAL METHODS IN INSPECTION

PURPOSE OF COURSE. To provide training in the use of statistical methods in the inspection of materials and in the control of industrial quality.

QUALIFICATIONS FOR ADMISSION. The applicant must be at least a high school graduate and should be engaged in production, inspection, testing, or quality control work. No previous knowledge of statistical methods is required, but it is desirable that the applicant have some aptitude for elementary mathematical analysis.

LENGTH OF COURSE. *Ten weeks* — one three-hour class. Total, including preparation, 75 hours.

COURSE CONTENT. (1) Good and bad sampling methods in inspection. (2) Determination of proper sample sizes. (3) Risks run by sellers and buyers when acceptance inspection is performed on a sampling basis. (4) Single and double sampling. (5) Statistical methods as an aid in controlling the quality of output. (6) Introduction to methods of identifying factors responsible for variable quality.

Have E. S. M. W. T. Courses Actually Increased Production?

Evidence from many sections of New England shows that college level war training courses have significantly enhanced the productivity of trainees. Industry realizes that people trained through specialized E.S.M.W.T. courses, directed to meet specific needs, reduce cost and speed up production. Manufacturers of airplanes claim that an E.S.M.W.T. course in Quality Control has made possible a very great decrease in inspection personnel with greater safety and with very large savings in production costs. One shipbuilding company traces savings of 10% in labor cost to E.S.M.W.T. training. A steel company credits E.S.M.W.T. instruction with an increase from 0.57 units to 2.66 units per man. Another heavy industry stated, "We have frequently selected employees trained under E.S.M.W.T. for new processes and equipment, and in four noteworthy instances, because of this training, obtained production in 50% of normal time."

How Can Industry Obtain E. S. M. W. T.?

Industrial executives who sense a need for college level training for certain of their employees in order to maintain or increase production, and who desire to explore the possibilities of E.S.M.W.T. should consult the Institutional Representative of the college or university nearest to their plant or the Regional Adviser. In general, the procedure for setting up courses is for the Institutional Representative of E.S.M.W.T. and representatives of the war industry to discuss the particular training problem and to obtain the technical advice of such members of the university staff as is appropriate in laying out the course content.

Call or write the nearest Institutional Representative or Regional Adviser listed on page two for further information.